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INT CL⁶ A47B , F16M
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(54) Cantilever support frame for video equipment

(57) A cantilever support frame for video equipment which is substantially disposed behind the video equipment supported thereon and is therefore almost invisible when viewing from a front side of the support frame. The support frame includes a fixing member 40 for mounting to a wall, a cantilever beam 10 connected at a rear end to the fixing member, a multi-directionally adjustable connector 60 having a lower part movably connected to the cantilever beam and an upper part pivotally connected to the lower part, a TV support 20 fixedly connected to the top of connector 60 for supporting a TV set, a coupler 50 having a U-shaped cross section with two side walls connected to two side walls of the cantilever beam, and a video tape recorder support 30 rotatably connected to a bottom side of the coupler for supporting a video tape recorder thereon.

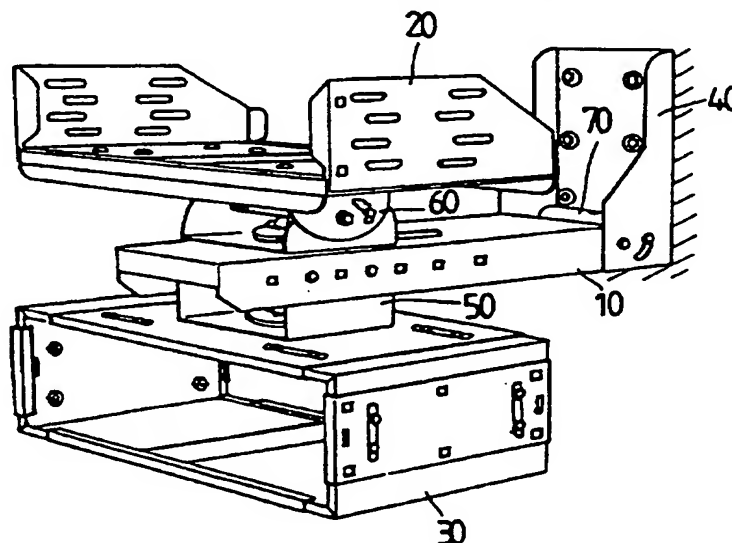


FIG.2

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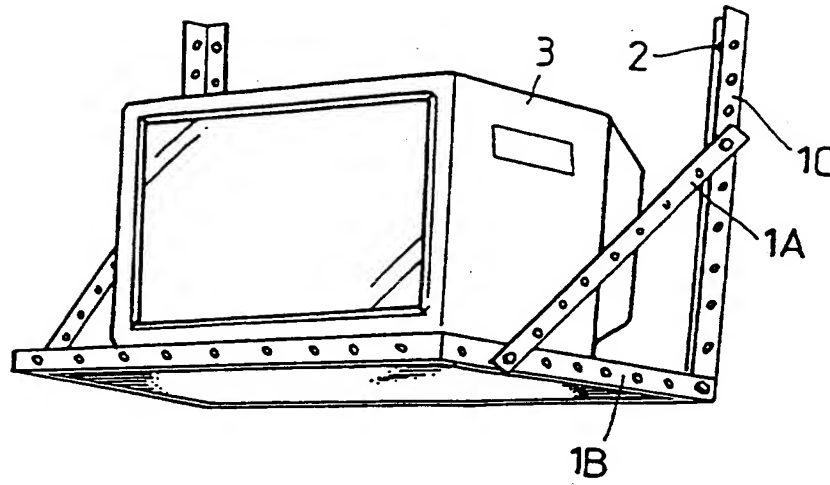


FIG. 1A (PRIOR ART)

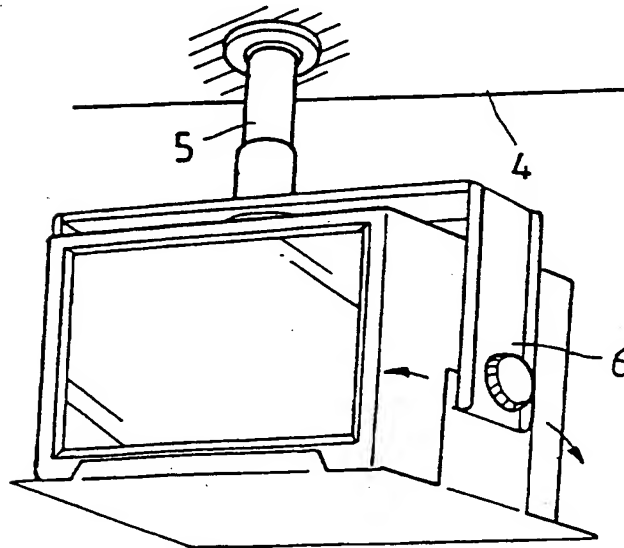


FIG. 1B (PRIOR ART)

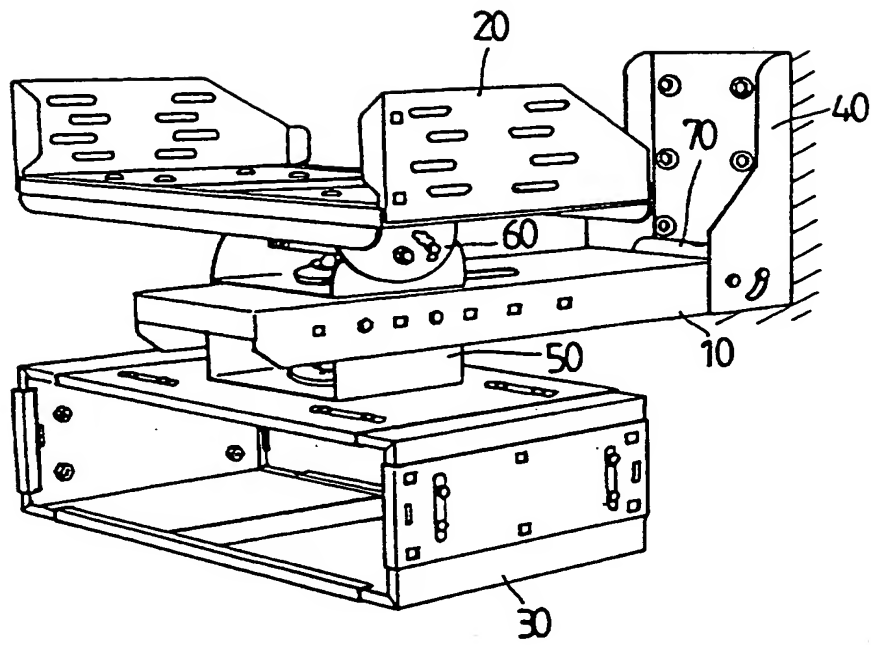


FIG. 2

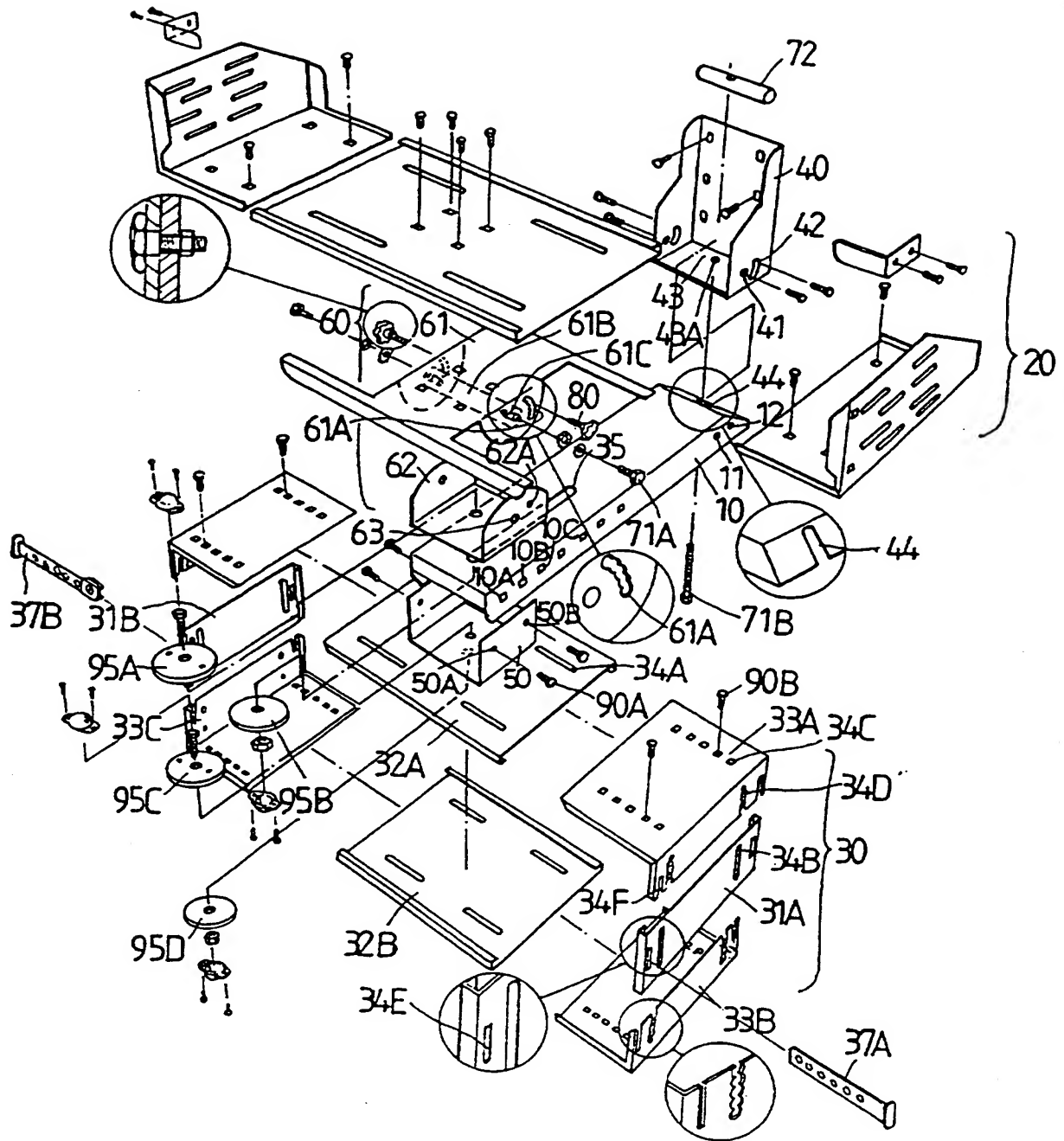


FIG. 3

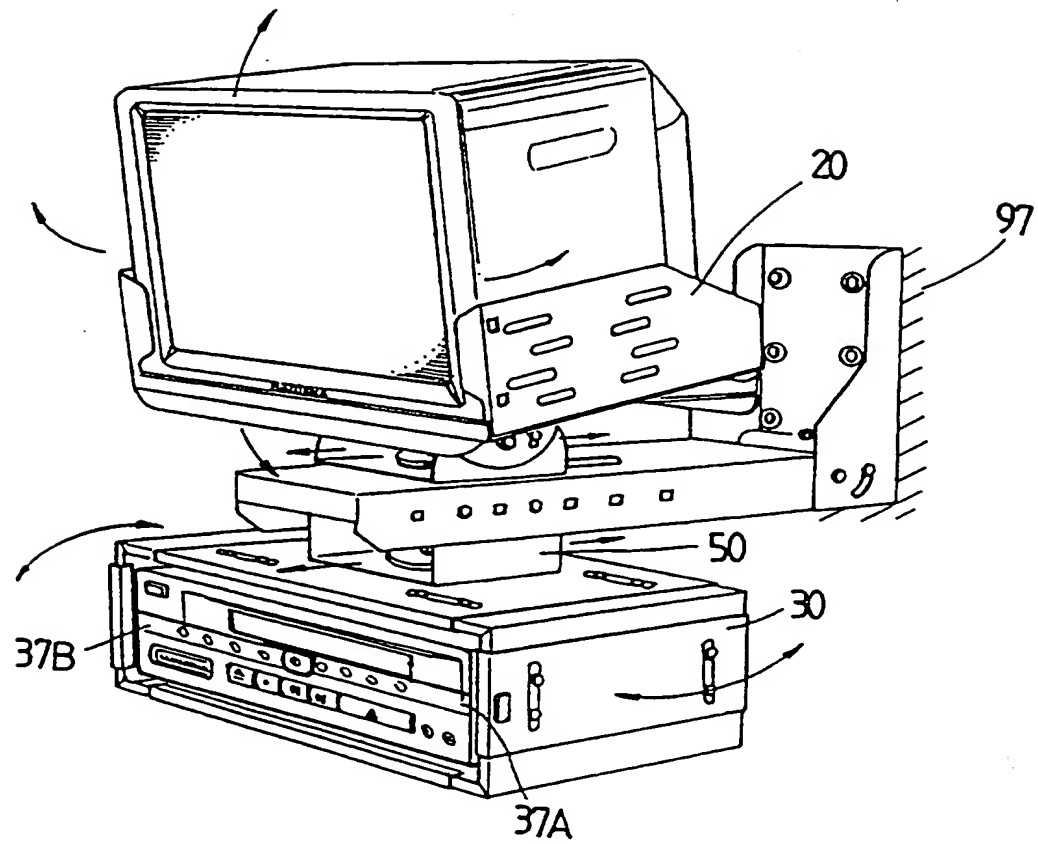


FIG. 4

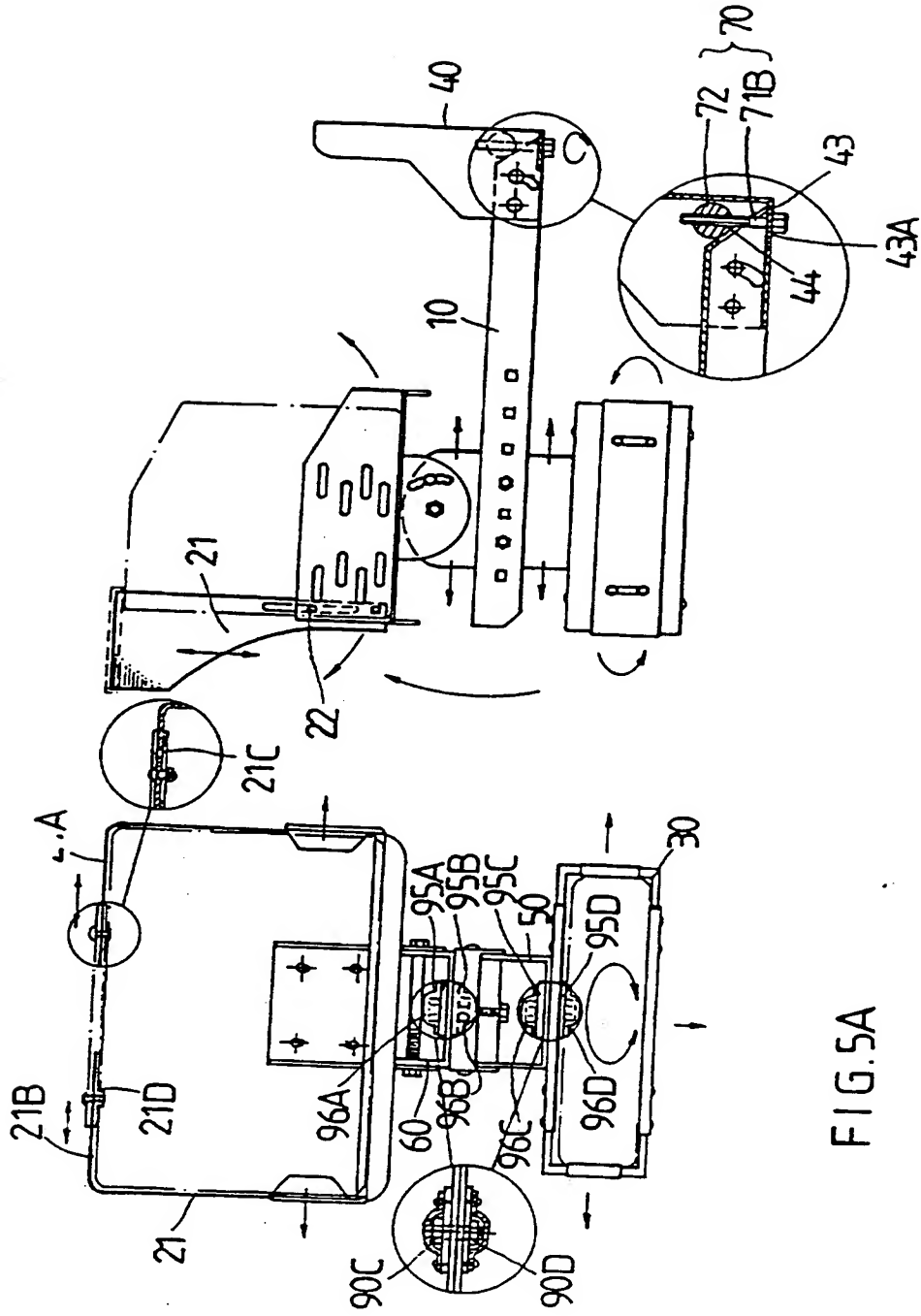


FIG. 5A

FIG. 5B

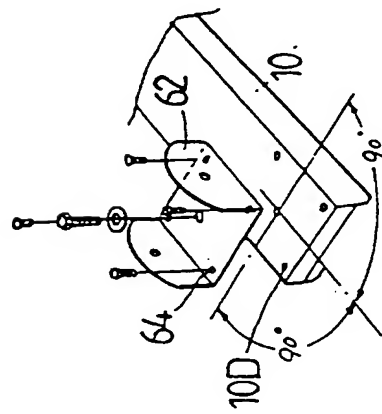


FIG. 6A

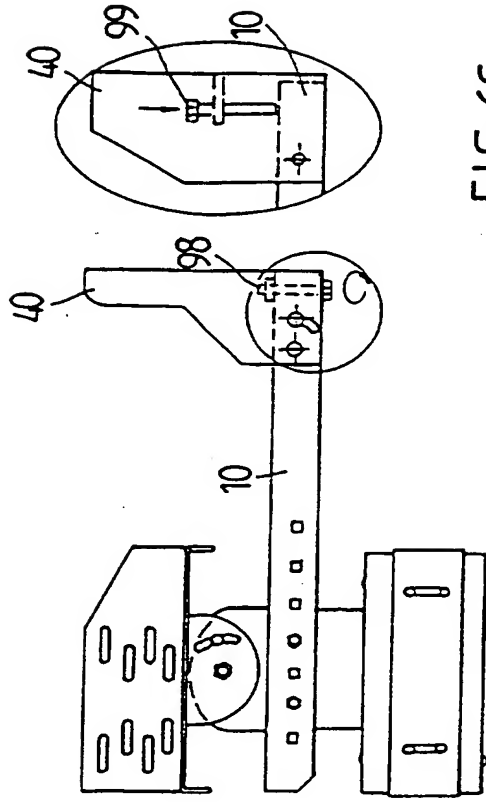


FIG. 6B

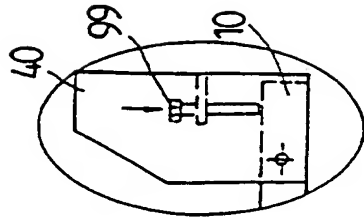


FIG. 6C

CANTILEVER SUPPORT FRAME FOR VIDEO EQUIPMENT

5 The present invention relates to a video equipment support frame, and more particularly to a video support frame having a cantilever beam fixed to a wall so that frames for supporting video equipment can be attached to a front end of the cantilever beam. The video equipment support frame of the present invention has simple structure and can be
10 easily adjusted to allow the video equipment supported thereon, such as a TV set, to be viewed from a comfortable angle.

15 The placement of different video equipments, such as a TV set, video tape recorder, etc., is no longer limited to a desktop. With the provision of various kinds of support frame, a video equipment can be mounted high on a wall in the public, such as in a station, a square, etc., for more people to watch or enjoy the visual information at the same
20 time. Since the video equipment itself is heavy in weight, it is necessary to consider the capability of the video support frame to support the equipment. Furthermore, it is also a prerequisite that the position of the supported equipment can be easily adjusted to allow the people to view
25 from a comfortable angle. Another important thing is that the support frame itself must not spoil the high quality feeling of the video equipment which constitutes a part of the public modern video construction.

30 Fig. 1A illustrates a commonly used conventional TV support frame. The frame is constructed from several angled sections 1A, 1B, 1C on each of which holes are provided for the sections to connect to one another by screws. Then, the

vertical sections 1C are fixed to a wall at a high position by means of steel nails 2. A video equipment 3, such as a TV set, is placed on the frame for people to watch. Such a support frame is quite simple and rough and usually limited to one size after it is assembled. Only one single type of video equipment can be fitted in the frame in one fixed direction while the equipment is not easily adjusted in its position.

Fig. 1B illustrates another conventional support frame. As shown, the support frame includes a thick supporting rod or tube 5 hanging from a ceiling 4 to connect a framework 6 thereto. A video equipment, for example, a TV set, is then disposed on the framework 6. The framework 6 is so designed that it can be adjusted to match the dimensions of different video equipments. And, the framework 6 can be adjusted to incline forward to some extent so that the TV set can be viewed from some more comfortable angle. However, the supporting rod or tube 5 and the framework 6, which are usually made of metal material, shall inevitably come into the visual field of the audience while they are actually not so well matched with the more elegant video equipment. Furthermore, the video equipment on the support frame can be adjusted only in a limited manner, that is, to slightly incline downward or upward.

It is therefore tried by the inventor to develop a video equipment support frame having a cantilever beam to replace the conventional video equipment support frame.

A primary object of the present invention is to provide a cantilever support frame for video equipment, in which a large part of a cantilever beam for supporting the video equipment and of a fixing member for mounting the entire

support frame to a wall are located behind the video equipment supported thereon without reversely affecting the elegant appearance of the video equipment.

5 Another object of the present invention is to provide the above cantilever support frame for video equipment, in which connecting means permitting multi-directional adjustment is employed to connect a TV set support to an upper front
10 portion of the cantilever beam, and a sliding slot is provided on the cantilever beam for the connecting means to slide forward or backward on and relative to the cantilever beam. In addition, a video tape recorder support is connected to a lower front portion of the cantilever beam
15 below the TV support by means of a coupler and rotatable disks. Thereby, a TV set and a video tape recorder can be simultaneously supported on the present invention and be adjusted to face different directions.

20 The detailed structure, applied principles, functions, and performance of the present invention can be best understood from the following detailed description of the preferred embodiments and the accompanying drawings, wherein

25 Fig. 1A illustrates a commonly used conventional video equipment support frame;

Fig. 1B illustrates another conventional video equipment support frame;

30 Fig. 2 is a perspective view of a cantilever support frame for video equipment according to the present invention;

Fig. 3 is an exploded perspective view of the cantilever support frame according to Fig. 2;

Fig. 4 illustrates a cantilever support frame for video equipment in use;

5 Fig. 5A illustrates an enlarged portion of the structure of the rotatable disks of the present invention;

10 Fig. 5B illustrates an enlarged portion of the manner in which the cantilever beam is connected to the fixing member mounted to a wall;

Fig. 6A illustrates another way to connect the lower part of the multi-directionally adjustable connector to the cantilever beam;

15 Fig. 6B illustrates another manner in which the cantilever beam is connected to the fixing member mounted to a wall; and

20 Fig. 6C illustrates still another manner in which the cantilever beam is connected to the fixing member mounted to a wall.

25 Please refer to Fig. 2 which shows a perspective view of the present invention. As shown, the present invention is a cantilever support frame for video equipment and mainly includes a) a fixing member 40 for mounting on a wall by means of nails to connect the rest components of the support frame, b) a cantilever beam 10 being perpendicularly connected at a rear end to the fixing member 40, c) a multi-directionally adjustable connector 60 further including a lower connecting part 62 and an upper connecting part 61, d) 30 a TV support 20, fixedly connected to the upper connecting

part 61 of the multi-directionally adjustable connector 60.
e) a coupler 50 having a U-shaped cross section and being
connected at two side walls to the cantilever beam by means
of screws, and f) a video tape recorder support 30 connected
5 to a bottom side of the coupler 50 for supporting a video
tape recorder therein.

Please refer to Fig. 3 which is an exploded perspective view
of the present invention. The cantilever beam 10 has a
10 front end pointing forward and being formed at two side
walls with a plurality of connecting holes 10A, 10B, 10C,
etc. The U-shaped coupler 50 is also formed at two side
walls with a plurality of threaded holes 50A, 50B, 50C, etc.
at intervals corresponding to that of the holes 10A, 10B,
15 10C, etc. on the cantilever beam 10, so that the coupler 50
is fixedly set in and connected to and below the cantilever
beam 10 by threading screws 90 through the holes on the
cantilever beam and their respective corresponding threaded
holes on the coupler 50.

20 The video tape recorder support 30 is assembled from a first
vertical panel 31A, a second side panel 31B, a first
horizontal panel 32A, a second horizontal panel 32B, and
L-shaped corner panels 33A, 33B, 33C, 33D for
25 interconnecting every two adjacent vertical and horizontal
panels. The video tape recorder support 30 is connected at
the first horizontal panel 32A to a bottom side of the
coupler 50 through a pair of rotatable disks 95C, 95D. Caps
96C, 96D are respectively covered onto the rotatable disks
30 95C, 95D for preventing a screw 90D screwed into the disks
from loosening and escaping from the disks. The vertical
panels 31A, 31B and the horizontal panels 32A, 32B are
formed with a plurality of sliding slots 34A and 34B.

respectively, and the corner panels 33A, 33B, 33C, 33D are provided with screw holes 34C at positions corresponding to the sliding slots 34A and chain-shaped slots 34D at positions corresponding to the sliding slots 34B. Screws 5 90B are used to thread through each set of corresponding holes 34C and slots 34A as well as corresponding chain-shaped slots 34D and slots 34B, so that the screws 90B are allowed to bring the corner panels 33A, 33B, 33C, and 33D to move along the slots 34A and/or 34B until the video 10 tape recorder support 30 is adjusted to the dimensions required to contain a desired video tape recorder therein. The vertical panels 31A, 31B are respectively formed near a front center with a slot 34E and the corner panels 33A, 33B, 33C, 33D are respectively formed with cuts 34F at positions 15 corresponding to the slots 34E, so that a pair of locking bars 37A, 37B are allowed to extend in opposite directions through the slots 34E to lock the video tape recorder inside the support 30 for security purpose.

20 The cantilever beam 10 is formed on a top surface with a sliding slot 35 extending along a longitudinal axis of the cantilever beam 10. Rotatable disks 95A, 95B are screwed to a top and a bottom side, respectively, of the cantilever beam 10 by means of a screw 90C extending through the 25 sliding slot 35, and thereby, are allowed to move along the sliding slot 35.

The multi-directionally adjustable connector 60 includes an upper connecting part 61 for connecting a TV support 20 30 thereto and a lower connecting part 62 for connecting to the top of the cantilever beam 10. A tubular shaft 61B having two internally threaded ends 61C transversely extends between two side walls of the upper connecting parts 61 to

project from two central holes formed on the side walls. The lower connecting part 62 is provided with shaft holes 63 at positions corresponding to the threaded ends 61C of the shaft 61B, such that the shaft 61B may extend through the two shaft holes 63 and screws 71A can be used to thread into the ends 61C of shaft 61B to pivotally connect the upper and the lower connecting parts 61, 62 together. An arcuated slot 61A is formed at each side wall of the upper connecting part 61. The arcuated slot 61A each has a chain-like profile, formed from a series of continued round holes. The lower connecting part 62 is formed with openings 62A at positions corresponding to the arcuated slots 61A. A retaining screw 80 is used to extend through each corresponding arcuated slot 61A and opening 62A. Changing the position of the retaining screws 80 in the arcuated slots 61A shall allow the upper connecting part 61 of the multi-directionally adjustable connector 60 to incline forward or backward by different angles. Since the TV support 20 is fixedly screwed onto the connector 60, the change in inclination of the connector 60 shall cause the TV support 20 to incline, too. The TV support 20 may also be constructed in the same manner as that of the video tape recorder support 30 so that it can be adjusted to match the dimensions of the TV set to be supported thereon.

The cantilever beam 10 is provided at each side near a rear end thereof with a shaft hole 11 and a retaining hole 12 to correspond to a shaft hole 41 and an arcuated slot 42, respectively, formed on each side of the fixing member 40 (which has an n-shaped cross section), so that the cantilever beam 10 can be connected in an inclination-adjustable manner to the fixing member 40 by bolts threading

through the shaft holes 41, 11 as well as the arcuated slots 42 and the retaining holes 12.

5 The fixing member 40 includes a bottom plate 43 on which a through hole 43A is formed. The cantilever beam 10 has a bevel end surface facing the fixing member 40. An upward extended cut 44 is formed on the bevel end surface of the cantilever beam 10 at a position corresponding to the through hole 43A on the bottom plate 43, so that a set of
10 fastening means 70 can be used to firmly lock the cantilever beam 10 to the fixing member 40 by upward extending a threaded bolt 71B from a bottom side of the plate 43 through the hole 43A and the cut 44 of the cantilever beam 10. Furthermore, a retaining shaft 72 having a central threaded
15 through hole is disposed above the bevel end surface of the cantilever beam 10 to engage with the upward extended bolt 71B. The threading of the bolt 71B through the bevel end surface of the cantilever beam 10 and into the threaded hole of the retaining shaft 72 enables the cantilever beam 10,
20 and accordingly, the TV support 20, and the video tape recorder support 30 connected thereto to be tightly and securely supported by the fixing member 40.

25 Please now refer to Fig. 4. To use the cantilever support frame of the present invention, first mount the fixing member 40 to a wall surface 97 at some higher position with suitable fastening means, such as nails, so that the entire support frame is fixedly attached to the wall. Then, position the selected TV set and video tape recorder into
30 the TV support 20 and the video tape recorder support 30, respectively. The locking bars 37A, 37B are locked together in front of the support 30 to prevent the video tape recorder positioned therein from being stolen. To obtain a

suitable visual angle for most people, slightly loosen the screws or bolts pivotally connecting different components to adjust the positions of these components relative to one another until a desired position or inclination is reached.
5 Then, tighten the screws or bolts again to securely and firmly connect the components again.

Fig. 5A illustrates in details the rotatable disks adopted in the present invention. As shown, two pairs of rotatable
10 disks 95A, 95B and 95C, 95D are used to connect the top of the cantilever beam 10 with the lower connecting part 61 of the multi-directionally adjustable connector 60 and a bottom of the U-shaped coupler 50 with the first horizontal panel 32A of the video tape recorder support 30 by means of screws
15 90C and 90D, respectively. Caps 96A, 96B and 96C, 96D are used to cover two ends of the screws 90C, 90D, respectively, to prevent the screws 90C, 90D from loosening and escaping from their respective corresponding rotatable disk pairs 95A, 95B and 95C, 95D. Since the rotatable disk pair 95C
20 and 95D provide larger contact surfaces than the screws 90C and 90D, the connector 60 and the video tape recorder support 30 may be moved or rotated relative to the cantilever beam 10 and the coupler 50, respectively, in a more stable manner.

25

An n-shaped light shield 21 may be attached to the TV support 20 by screws threading through holes 22 provided on two side walls of the support 20, so that light from lamps on a ceiling can be blocked by the light shield 21 without
30 being reflected from a screen of the TV set. The light shield 21 can be assembled from two lateral parts 21A and 21B such that the lateral parts 21A, 21B partially overlap with each other at a top portion thereof. Sliding slots

21C, 21D are provided on the top portions of the two lateral parts 21A, 21B, and sliding slots 21E, 21F are provided on two vertical side portions of each lateral parts 21A, 21B corresponding to the holes 22 on the TV support 20, such that the lateral parts 21A, 21B can be horizontally and vertically shifted to adjust their position and dimensions in response to the dimension adjustment of the TV support 20.

Fig. 5B illustrates in details the connection of the cantilever beam 10 to the fixing member 40. The cut 44 formed on the bevel end surface of the cantilever beam 10 is in alignment with the through hole 43A formed on the bottom plate 43 of the fixing member 40, allowing the threaded bolt 71B to upward screw thereinto and thread through the retaining shaft 72 transversely disposed between the bevel end surface of the cantilever beam 10 and the fixing member 40. The retaining shaft 72, when being tightly screwed to the bolt 71B, will tightly press the bevel end surface of the cantilever beam 10 against the fixing member 40. The bevel end surface of the cantilever beam 10 increases the contact area between the bevel surface and the retaining shaft 72 and thereby provides enhanced locking effect.

Fig. 6A illustrates another way to connect the lower connecting part 62 of the connector 60 to the cantilever beam 10. As shown, holes 64 are formed on four corners and a center of a bottom plate of the lower connecting part 62; and, threaded holes 10D are formed on the top of the cantilever beam 10 at positions corresponding to the holes 64. Screws are used to thread through the holes 64 and the threaded holes 10D so that the lower connecting part 62 is connected to the cantilever beam 10. Before fixedly

connecting the lower part 62 to the cantilever beam 10, the former can be turned either leftward or rightward by 90 degrees, so that the rotatable disk pair 95A, 95B can be more easily connected to the cantilever beam 10 and the lower connecting part 62. Fig. 6B illustrates another way to connect the rear end of the cantilever beam 10 to the fixing member 40. As shown, a set of fixing threaded bolt 98 is used to extend through and firmly connect the cantilever beam 10 and the fixing member 40 together. Fig. 6C illustrates a still another way to connect the two components. As shown, a holder projects sideward from an upper central portion of the fixing member 40, a fixing threaded bolt 99 downward extends through the holder to firmly press a lower end thereof against the rear end of the cantilever beam 10, permitting the whole support frame to be securely held to the wall 97.

With the above arrangements, the cantilever support frame for video equipment of the present invention has simple structure without spoil the elegant appearance of the video equipment supported thereon. In addition, the support frame can be adjusted to have different orientations and inclinations and thereby effectively improves the conventional completely fixed video equipment support frames.

The above description and accompanying drawings are only used to illustrate a preferred embodiment of the present invention, not intended to limit the scope thereof. Many changes and modifications of the embodiment can be made without departing from the spirit of the present invention.

CLAIMS

1. A cantilever support frame for video equipment, comprising:

5

a) a fixing member being mounted onto a wall by means of fasteners to connect and support other components of said cantilever support frame;

10

b) a cantilever beam being connected at a rear end to a top surface of a bottom plate of said fixing member and being formed at two side walls with a plurality of threaded holes;

15

c) a multi-directionally adjustable connector, further comprising a lower connecting part and an upper connecting part.

20

said lower connecting part having a substantially U-shaped cross section and being formed at two side walls with a plurality of threaded holes, and said lower connecting part being connected at a bottom portion to a top surface of said cantilever beam;

25

said upper connecting part being a loading board member with two ear portions downward extending from two sides thereof, a pivotal shaft hole and an arcuated slot being formed on each of said ear portions with a pivotal shaft extending between said pivotal shaft holes, such that said upper connecting part is allowed to pivotally turn about said pivotal shaft within a range defined by said arcuated slots to incline upward or downward relative to said lower connecting part;

30

d) a TV support being fixedly connected to said upper connecting part of said multi-directionally adjustable connector for supporting a TV set thereon;

5 e) a coupler having a substantial U-shaped cross section and being formed at two side walls with a plurality of threaded holes which are in alignment with said threaded holes formed on two side wall of said cantilever beam so that screws can be used to thread through any one pair of these threaded
10 holes to adjustably connect said coupler to said cantilever beam; and

f) a video tape recorder support being connected to a bottom side of said coupler for supporting a video tape
15 recorder thereon.

2. A cantilever support frame for video equipment as claimed in claim 1, wherein said video tape recorder support and said TV support are assembled from a plurality of vertical
20 panels, horizontal panel, and L-shaped corner panels, said vertical panels and said horizontal panels having sliding slots formed thereon, said corner panels having threaded holes formed at positions corresponding to said sliding slots formed on said horizontal panels and having chain-like
25 slots (formed from several continued round holes) formed at positions corresponding to said sliding slots formed on said vertical panels, whereby when screws are used to slidably thread through said threaded holes on said corner panels and said sliding slots on said horizontal panels or through said
30 chain-like slots on said corner panels and said sliding holes on said vertical panels, said vertical, horizontal, and corner panels are adjustably connected with one another

to form a support frame having dimensions suitable for supporting a selected video tape recorder and/or a TV set thereon.

- 5 3. A cantilever support frame for video equipment as claimed in claim 1 or 2, wherein said pivotal shaft extending between said two ear portions of said upper connecting part of said multi-directionally adjustable connector has two internally threaded ends forming two pivotal shaft holes.
- 10
4. A cantilever support frame for video equipment as claimed in claim 3, wherein said lower connecting part of said multi-directionally adjustable connector is connected to said top of said cantilever beam and said video tape recorder support is connected to said bottom side of said coupler by screws threading through central openings formed on each of said components and through rotatable disk pairs separately disposed above and below said central openings.
- 15
- 20 5. A cantilever support frame for video equipment as claimed in claim 4, wherein said cantilever beam is formed at its top surface with a sliding slot extending along the length of said cantilever beam, whereby said lower connecting part of said multi-directionally adjustable connector and said rotatable disk pairs connected together by said screw extending through said sliding slot of said cantilever beam to connect said lower connecting part to said cantilever beam are allowed to slidably and rotatably move along said sliding slot of said cantilever beam, and said TV support is
- 25
- 30 allowed to orient to different directions on said support frame.

6. A cantilever support frame for video equipment as claimed in claim 1 or 2, wherein said cantilever beam is formed on each side wall near said rear end with a shaft hole and a retaining hole, and said fixing member being formed at each side wall with a shaft hole and an arcuated slot corresponding to said shaft holes and retaining holes of said cantilever beam, respectively, such that screws can be extended therethrough to connect said rear end of said cantilever beam to said fixing member, and wherein said fixing member is formed on said bottom plate with a through hole and said cantilever beam has a bevelled rear end surface facing said fixing member, said bevelled rear end surface being provided with a cut corresponding to said through hole of said fixing member, allowing a set of locking components to extend through said cut and said through hole and thereby connect said cantilever beam to said fixing member; said set of locking components including a threaded bolt and a retaining shaft, said retaining shaft having a central threaded hole and being transversely disposed between said bevelled rear end surface and said fixing member, and said threaded bolt being vertically threaded upward through said through hole on said bottom plate of said fixing member and said cut on said bevelled rear end surface of said cantilever beam and finally engaging into said central threaded hole of said retaining shaft to cause said retaining shaft to firmly press said bevelled rear end surface against said bottom plate.

7. A cantilever support frame for video equipment as claimed in claim 1, wherein said arcuated slots formed on said ear portions of said upper connecting part of said multi-directionally adjustable connector are chain-like slots formed from several continued round holes, whereby screws

extending thereinto can be slightly loosened to allow said upper connecting part to shift along said arcuated slots gradually until it reaches a desired inclination relative to said lower connecting part, and said screws can be tightened again to located said upper connecting part.

5

8. A cantilever support frame for video equipment as claimed in claim 2, wherein each of said vertical panels is provided at a front end with a central slot and each of said corner panels is provided with a cut at a position corresponding to said central slot on said vertical panels, so that a pair of locking bars are oppositely extended through said central slots and said corresponding cuts to lock together, thereby a video tape recorder supported on said video tape recorder support is safeguarded from being stolen.

10

15

9. A cantilever support frame for video equipment as claimed in claim 4, wherein said screws used to thread through said rotatable disk pairs are covered with caps to prevent said screws from becoming loosened and escaping from said rotatable disk pairs.

20

10. A cantilever support frame for video equipment as claimed in claim 3, wherein said lower connecting part is provided at four corners and a center with holes to correspond to threaded holes formed near a front portion of said cantilever beam, such that screws can be threaded through said holes to connect said lower connecting part to said cantilever beam to simplify the rotatable connection between said lower connecting part and said cantilever beam.

25

30

11. A cantilever support frame for video equipment as claimed in claim 1, wherein said rear end of said cantilever

beam is firmly connected to said fixing member by means of a threaded bolt to provide necessary support to the other components of said support frame.

5 12. A cantilever support frame for video equipment as
claimed in claim 1, wherein said rear end of said cantilever
beam is firmly connected to said fixing member by means of a
fixing bolt threading through a holder projected from an
upper central portion of said fixing member to firmly press
10 against said rear end of said cantilever beam for the same
to provide necessary support to the other components of said
support frame.

13. A cantilever support frame for video equipment as
15 claimed in claim 1, wherein said TV support is provided at
two side walls with threaded holes, so that screws can be
threaded therethrough to connect an n-shaped light shield
over said TV support, blocking light from lamps on a ceiling
and thereby preventing light reflecting from a screen
20 of said TV set supported on said TV support.

14. A cantilever support frame for video equipment as
claimed in claim 2, wherein said vertical panels of said TV
support are formed with threaded holes for an n-shaped light
25 shield to connect thereto by means of screws, said n-shaped
light shield being assembled from two partially overlapped
lateral parts and having laterally extended sliding slots
formed at a top surface thereof and vertically extended
sliding slots formed at two side walls thereof corresponding
30 to said threaded holes formed on said vertical panels of
said TV support, whereby screws or connecting pins may be
threaded through said lateral sliding slots and said
vertical sliding slots to allow said two lateral parts of

said light shield to shift laterally or vertically along with said TV support when the latter is adjusted to have desired dimensions.

15. A cantilever support frame for video equipment substantially as herein described with reference to Figures 2 to 5 or those Figures as modified by Figure 6A, 6B or 6C, of the accompanying drawings.



Application No: GB 9607029.7
Claims searched: 1-15

Examiner: John Graham
Date of search: 11 June 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): A4B

Int Cl (Ed.6): A47B. F16M

Other: ONLINE DATABASE: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 1249774 (DAZOR) whole document	1

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.